



KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Food Technology) 2023 Admission
III Semester Final Examination – January 2025

Pafe.2116

Fundamental Unit Operetaions in Food Processing (2+1)

Marks: 50
Time: 2 hours

- I Fill in the blanks (10x1=10)**
1. The opening of 100 Mesh size is equal to -----mm.
 2. For a spherical particle of diameter D_p , the sphericity is -----
 3. Units of power in MKS -----
 4. For powders the particle size distribution is by -----or ----- analysis
 5. What is the speed of centrifuge in RPM when it rotates at angular Velocity of 100 (rad/s) -----
 6. Name a commonly used machine for primary size reduction-----
 7. Name a common type of mixing equipment used in industries-----
 8. Give an example of a depth filter medium-----
 9. What is the primary driving force in membrane filtration processes-----
 10. Membranes to separate components of a mixture based on differences in----- or -----
- II Write short notes on ANY FIVE of the following (5x2=10)**
1. What is size reduction in mechanical operations?
 2. Define the term Work index.
 3. What is the difference between mixing and blending?
 4. Why is mixing important in food processing?
 5. What is the purpose of a filter aid in filtration?
 6. How does membrane filtration differ from traditional filtration methods?
 7. What are the applications of Membrane operations in food processing ?
- III Answer ANY FIVE of the following (5x4=20)**
1. Discuss briefly about the size reduction equipment ?
 2. Explain principle and mechanism of Attrition mill?
 3. Write short notes on clarifiers and decanting equipment ?
 4. Explain with a neat sketch of plate and frame filter press?
 5. Explain with neat sketch of centrifugal separation ?
 6. Explain about the membrane materials for membrane construction ?
 7. Briefly explain the principle of Microfiltration and applications ?
- IV Write an essay on ANY ONE of the following (1x10=10)**
1. a) Discuss briefly about the working of Ball mill.
b) A certain crusher accepts a feed material having a Volume-surface mean diameter of 19mm and gives a product of Volume-surface mean diameter of 5mm. The power required to crush 15 tons/hr is 7.5 KW. What will be the power consumption if the capacity is reduced to 12 tons/hr?
 2. a) What is Concentration Polarization in membrane process ?
b) A rotary drum filter having 33% submergence of the drum in the slurry is to be used to filter a CaCO_3 slurry using a pressure drop of 67 kPa. The solids concentration in the slurry is 0.191 (c_x)kg solids/kg slurry and the filter cake mass ratio, m is 2.0. The density and viscosity of the filtrate is assumed that of the water at 25°C, density is 997 kg/m³ and viscosity is 0.89 cp. Calculate the filter area needed to filter 0.778 kg slurry/s. The filter cycle is 250 s. The specific cake resistance is 1.225×10^{11} m/kg.
